# THE HAWTHORN BLOSSOM WEEVIL (ANTHONOMUS NEBULOSUS LEC.)*

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One of the most interesting and injurious of the insects found on the hawthorns is this member of a very destructive genus of blossom weevils. Its mode of life resembles in a general way that of the Mexican cotton boll weevil, *Anthonomus grandis*, and is almost identical with that of the European apple blossom weevil, *A. pomorum* (see Theobald, 1909, p. 104-110).

The original description of *A. nebulosus* by Dr. Leconte may be found in the Proceedings of the American Philosophical Society 15:197, 1876, and a more complete description is given by Dietz in the Transactions of the American Entomological Society, 18:203, 1891. In the present account it is sufficient to say that *A. nebulosus* is a brown or grayish oval beetle, 3.75–4.25 mm. long, generally with a whitish V-shaped mark on the fore part of the elytra, with a long slender curved beak, and the front femur bearing two teeth on its apical portion, one a large and the other a small tooth.

It has been found in New York, New Jersey, Michigan, Indiana, Missouri, Arkansas and Louisiana, so it seems probable that it is present wherever its hosts are found East of the Rocky Mountains. Although Dietz considers this species to be more characteristic of the European fauna than of our own, no record can be found of its occurrence in Europe or elsewhere outside of our country.

Its hosts include a number of the larger flowered species of hawthorns, such as *Crataegus punctata*, *C. brainerdi*, *C. pruinosa* and *C. mollis*. The smaller flowered species such as *C. oxyacantha* are not selected by the beetles for oviposition, probably because there is not space enough for the full development of the larva within the bud.

The injury caused by the hawthorn blossom weevil is most apparent while the trees are in full bloom. At that time infested blossoms are brown and remain closed. On badly infested trees fully 50 per cent of the blossoms may be in that condition and the trees present a scorched appearance. As

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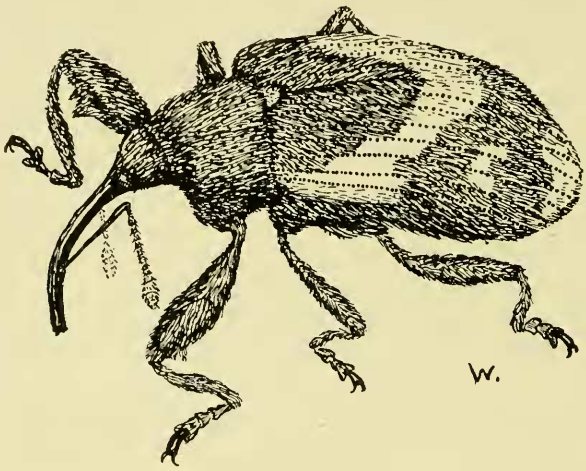
the young fruit begins to set the infested blossoms commonly fall to the ground, but may sometimes be seen on the trees even after the beetles have emerged in June.

They come out of hibernation and appear on the branches of the hosts about mid-April, feeding ravenously on the buds which are showing green. It is not uncommon to see a beetle with feet braced and beak inserted up to the eyes in a bud while it hurriedly eats the tender leaves within. As soon as all the food within reach of the entrance hole is eaten, the beetle seeks another bud on the twig and repeats the process. The puncture in the bud is round, .3 mm. in diameter, and turns




dark as soon as the beak is withdrawn. The presence of the beetles may be detected by these dark round holes in the buds before the egg-laying period arrives. They continue to feed on the buds during suitable weather until the clusters have separated enough for oviposition in the blossoms.

During cool weather they remain inactive, generally in the axils of the twigs with heads down. A few observations on the relation of temperature to their activities were made, and these indicate that the beetles remain inactive while the temperature is below 50° F. The optimum temperature is 60° to 70° and when it is raised to 78°, they rush about like mad, attempting to oviposit in every bud. Under most conditions they seem reluctant to fly, but when placed on distasteful food

they fly away. They continue their activities on cloudy or rainy days and at night if the temperature is sufficiently high.

The period between the opening of the blossom clusters and the opening of the blossoms themselves is the time of oviposition, and the length of this period probably influences the amount of injury to a considerable extent. If it is prolonged by cool, cloudy weather, then eggs may be placed in more blossoms before they open. The oviposition period comes about May 15 at Ithaca.

After selecting a suitable blossom bud the female makes a hole in the side of the calyx with her beak, then turning around she thrusts the egg into the hole with her ovipositor and moves to another bud to repeat the process. A clear liquid fills the hole where the egg is thrust in, which soon hardens and seals the opening completely. The act of oviposition requires about 10 minutes when the temperature is 68° or 70°, but requires an hour at 54°.

The egg is pearly white, .6 mm. long, .36 mm. wide, elliptical generally the same size at both ends, but when tucked in tightly between the anthers it may be narrower at one end to conform to the space it fills. It is almost the same size and color as the anthers and difficult to distinguish from them. The corium is smooth, unsculptured, delicate, drying and collapsing when exposed to the air for one hour.

After about a week the young white curved legless larva is found within the bud. It feeds upon the anthers and as it grows consumes all the internal parts of the flower, but leaves intact the wall of the receptacle and the closed petals which form the roof of its house. The petals become stiff, as if they were starched, and do not shrink away as they turn brown. After feeding a couple weeks, the larva is dirty white, 6 to 8 mm. long, legless, has a small brown head and lies in a curved position. At about this time it moults and changes to a white free pupa 6 mm. long, with a dark caudal spine, 2 dark prominent spines on the apex of the head and several smaller spines farther back on the head. After pupating during a week or a little longer, the beetle makes a hole in the top or side of its house with the beak and emerges.

It begins to feed a few minutes after emergence, choosing for its food the first young thorn or fruit in its pathway as it wanders along the branch. The thorns of the current season's

growth seem to be a very attractive food. A hole is drilled near the base of the thorn and the beetle will spend hours with the beak inserted in the hole clear up to the eyes, prying and straining to enlarge the cavity within the thorn. The round hole at the base of a thorn does not heal during the season's growth and the presence of such holes will indicate at any time of the year the presence of the blossom weevils. The beetles also attack the fruit and make several round holes in a single fruit before seeking another. The holes become brown almost immediately. I have never found the beetles eating leaves or tender twigs, but they sometimes feed on the succulent globular leaf galls of cecidomyiid larvæ. They will puncture and feed on young apples in the cages when fresh haws are not to be had, but I have found none feeding on apples in the field.

After feeding for a week or ten days the beetles may be found in copulation on the branches, and a week or so later, as warm July weather comes, they disappear from the trees. Those kept in breeding cages remained hidden in fallen curled leaves and hollow twigs on the ground all summer and winter without feeding until the next spring. A search for their hiding places in the field revealed a score of the beetles enclosed in curled dried leaves on the ground beneath their host trees.

The life cycle may be summarized as follows: The immature stages (egg, larva and pupa) are completed within the closed blossom in from 27 to 35 days and the remainder of the year is passed in the adult stage. The adults feed on thorns and fruit for two or three weeks after emerging from the blossoms, then remain quiescent among fallen leaves on the ground until the next spring, when they feed for about a month on the buds before ovipositing. Soon after oviposition the beetles die. In New York the eggs are laid about mid-May and the beetles emerge from the blossoms in June. Pierce says the beetles emerge in late March and early in April in Louisiana. The time of their development in different latitudes is dependent on the opening of the hawthorn blossoms in those latitudes.

A number of natural enemies of the blossom weevil have been observed. Various birds and especially sparrows pick open the brown blossoms to eat the larvæ and pupæ. Pierce found them to be parasitized by *Catolaccus hunteri* and *Sigalphus* sp. (U. S. Bur. Ent. Bull. 100, p. 77). The writer has bred another chalcid, *Habrocytus pierceci* Cwfd. from the larva of the weevil, the adult parasites emerging June 16th and 17th.